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TRUCK RESTRICTION STUDY

CALTRANS – DISTRICT 11

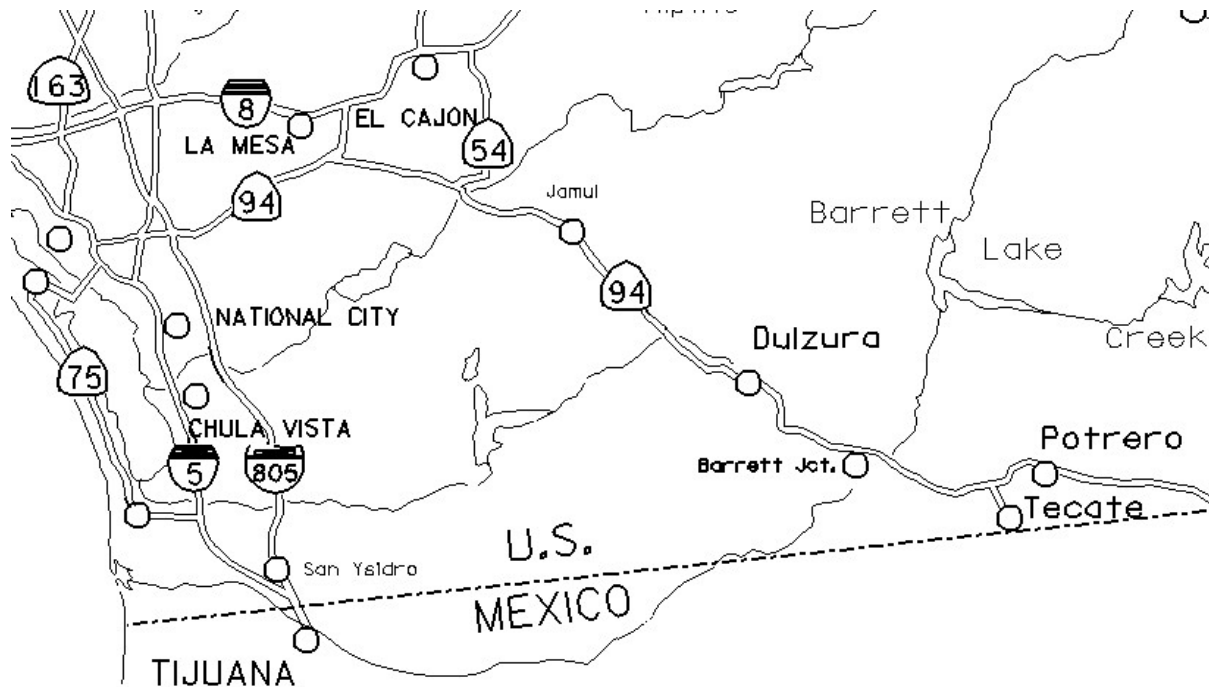
SAN DIEGO COUNTY

STATE ROUTE 94

OTAY LAKES ROAD TO STATE ROUTE 188

KP 39.7 TO KP 62.6

(PM 24.7 TO PM 38.9)



January 1999

PURPOSE AND NEED

This study provides information for assessing the appropriateness of truck restrictions on a portion of State Route 94 (SR-94) from Otay Lakes Road KP 39.7 (PM 24.7) to State Route 188 (SR-188) KP 62.6 (PM 38.9). It evaluates the safety issues related to trucks crossing the centerline (barrier stripe) into the opposing lane while negotiating curves. This problem has two parts: the length of trucks currently using the highway, and the existing nonstandard¹ roadway geometrics (lane/shoulder widths and horizontal curve length/radius) on SR-94.

This document is Phase I of a two-phase study. The segment of SR-94 from SR-188 KP 62.6 (PM 38.9) to Interstate 8 (I-8) KP 105.7 (PM 65.3) will be evaluated in the near future. SR-188 is a 3.1 km (1.8 mi) segment of highway that connects SR- 94 with the international port of entry at Tecate, Mexico will also be evaluated in a future study.

This study is the first step in consideration of truck restrictions in accordance with section 35401(f) of the California Vehicle Code (Appendix A).

BACKGROUND

SR-94 is classified as a principal arterial between downtown San Diego and SR-188, and as a minor arterial from SR-188 to I-8. It was included as part of the National Highway System in November of 1995. Before passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the study section of SR- 94 was classified as a rural minor arterial and was part of the Federal Aid Primary System. SR-94 was adopted into the State Highway System in 1933, and is being considered for designation as a State Scenic Highway (Exhibit 1).

In accordance with the *Truck Kingpin to Rear Axle Length State Highway System Evaluation Report* dated December 1989, the section of SR-94 from Otay Lakes Road KP 39.7 (PM 24.7) to Tierra Del Sol Road KP 101.7 (PM 63.2) has been identified as geometrically inadequate for use by truck tractor-semitrailer combinations exceeding a 9.14 m (30 ft) kingpin to rear axle (KP-RA) length (Exhibit 3). This section of SR-94 traverses mountainous terrain, and is shown on the *Truck Networks on California State Highways* map as a route not advised for tractor-semis with kingpin to rear axle length over posted value (KP-RA Advisory). The posted value along this section is a maximum KP-RA length of 9.14 m (30 ft).

Interstate commerce must also be addressed when truck restrictions are considered. The United State Supreme Court has ruled that truck length can not be restricted unless atypical accident rates have established a substantial impact on safety.

Caltrans conducted a field evaluation in February 1998. The vehicle used was a truck tractor-semitrailer with a 14.63 m (48 ft) trailer and the KP-RA length set to 12.19 m (40 ft). The truck was driven along SR- 94 in both directions from Otay Lakes Road KP 39.8 (PM 24.7) to Tierra Del Sol Road KP 101.7 (PM 63.2) and along SR-188 from the junction at SR-94 to the international boundary at Tecate. The truck was video taped to document where the

¹ Does not meet the minimum standards in the Highway Design Manual, Section 307.3 and Design Information Bulletin Number 79

tires crossed the centerline stripe and/or went off the edge of pavement. This occurred at areas with nonstandard horizontal curves (radius between 76-92 m (250-300 ft)) and narrow shoulders. The locations of these areas within the study limits are shown on Exhibit 2 and listed in the following table:

AREAS ON SR-94 WITH KP-RA LIMITING ROADWAY GEOMETRICS (Between Otay Lakes Road to SR-188)		
LOCATION	KILOMETER POST	(POST MILE)
A	KP 41.0 – KP 41.2	(PM 25.5 – PM 25.6)
B	KP 43.0 – KP 43.1	(PM 26.7 – PM 26.8)
C	KP 43.6 – KP 43.9	(PM 27.1 – PM 27.3)
D	KP 43.9 – KP 44.1	(PM 27.3 – PM 27.4)
E	KP 44.3 – KP 44.4	(PM 27.5 – PM 27.6)
F	KP 45.7 – KP 45.9	(PM 28.4 – PM 28.5)
G	KP 46.7 – KP 46.8	(PM 29.0 – PM 29.1)
H	KP 59.7 – KP 60.7	(PM 37.1 – PM 37.7)

EXISTING FACILITY

State Route 94 connects the City of San Diego with smaller east county rural communities and Interstate 8 near the community of Boulevard. It is also the only east/west route on the United States side of the U.S./Mexico international border connecting Tecate, Mexico with San Diego. In addition to local traffic, it serves both interregional and international travel in the area.

Within the study area, Route 94 is a two-lane conventional rural highway consisting of two asphalt concrete lanes varying from 2.74 m (9 ft) to 3.66 m (12 ft) with paved shoulders varying from 0 to 2.44 m (8 ft).

TRAFFIC

Traffic Volumes and Operating Conditions

ROUTE 94 SEGMENT	YEAR	ADT	LEVEL OF SERVICE
Otay lakes Road to Route 188 KP 39.7 – 62.6 (PM 24.7 – 38.9)	1997	7,400	E
	2020	12,000	F

The 1997 truck traffic was approximately 8% of the Average Daily Traffic (ADT).

Accident History

The accident history data from the Traffic Accident Surveillance & Analysis System (TASAS) Report for the period of **January 1, 1995 through July 31, 1998**² indicate the following accident rates:

ROUTE 94 SEGMENT	TOTAL ACCIDENTS (ACC)	ACTUAL (ACC/MVM)			AVERAGE ³ (ACC/MVM)		
		F	F+I	Total	F	F+I	Total
Otay lakes Road to Route 188 KP 39.7 – 62.6 (PM 24.7 – 38.9)	159	.022	0.50	1.17	.039	0.92	1.70

ACC = Accidents

MVM = Million Vehicle Mile

F = Fatal Rate (# Fatal Accidents)/MVM

I = Injury Rate (# Injury Accidents)/MVM

PDO = Property Damage Only Rate (# PDO Accidents)/MVM

Total = Total Rate (# Fatal + # Injury + # PDO Accidents)/MVM

The TASAS report listed **15** accidents involving trucks for the time period and post mile limits shown above. Trucks comprise 8% of the average daily traffic, therefore; approximately 13 truck related accidents would be anticipated. While truck accidents are not significantly high within the study area, SR-94 is in need of operational improvements due to slow moving vehicles (trucks, vans, and recreational vehicles) causing traffic congestion and delay.

California Highway Patrol (CHP)

The CHP has responsibility for the traffic law enforcement activities on Route 94. Since 1991 the CHP has enhanced truck inspection activities and in response to community concerns, they have recently stepped up their surveillance and enforcement along the route resulting in an increase in citations for vehicles crossing the centerline.

U.S. Border Patrol

A temporary Border Patrol inspection facility opened in 1993. It is located just east of Otay Lakes Road on Route 94 at KP 40.6 (PM 25.2). Recently the Border Patrol has increased⁴ their enforcement activities and assumed the County Sheriff's responsibility to address complaints about trespassing within the study area.

VEHICLE CODE

² 1998 accident reports processed after the date of the TASAS request (8-6-98) are not included in this total.

³ Statewide average for similar facilities.

⁴ As of September 1997, the Border Patrol's San Diego County Section has increased their staff from 992 to 2240.

The California Vehicle Code (CVC) Section 35000, Division 15 governs vehicle width, length, height, weight, and load limits. These sections define, where federal law has not preempted, the California legal truck that must be allowed to operate on every state highway and local street or road. The general rule and the more important exemptions and conditions of the codes relating to truck length are summarized below. The CVC should be consulted for further details, and other exceptions and conditions not listed here. The current CVC uses English units; therefore no Metric equivalent units are shown in the following summary and excerpts.

General Rule

CVC Section 35400 provides, as a general rule, that no vehicle shall exceed a KP-RA length of 40 feet. However numerous exceptions to this rule are listed in the section.

CVC Section 35401(a) provides that no combination of vehicles shall exceed a total length of 65 feet.

CVC Section 35401(b) states that for a truck tractor, semitrailer, and trailer combination, the total length shall not exceed 75 feet if the length of neither the semitrailers nor the trailer in the combination of vehicles exceed 28 feet 6 inches.

Exceptions and Conditions

CVC Section 35400(b)(4) states that the 40 foot limitation does not apply to a semitrailer when being towed by a motor truck or truck tractor if the distance from the center of the kingpin to the center of the rearmost axle, for semitrailers having two or more axles, does not exceed 40 feet. For semitrailers having one axle, this distance is 38 feet.

CVC Section 35401(f) permits Caltrans to restrict the kingpin to rear axle length of semitrailers to not less than 38 feet. The basis for this is safety. The general rule is 40 feet. This section is also the basis for the maximum kingpin to rear axle KP-RA advisory signing on designated state highways.

“Whenever, in the judgement of the Department of Transportation, any state highway cannot, in consideration of public safety, sustain the operation of trailers or semitrailers of the maximum kingpin to rearmost axle distances permitted under Section 35400, the director, in consultation with the Department of the California Highway Patrol, shall compile data on total traffic volume, frequency of use by vehicles covered by this subdivision, accidents involving these vehicles, and other relevant data to assess whether these vehicles are a threat to public safety and should be excluded from the highway or highway segment. The study, containing the conclusions and recommendations of the director, shall be submitted to the Secretary of the Business, Transportation and Housing Agency. Unless otherwise notified by the Secretary, the Director shall hold public hearings in accordance with the procedures set forth in Article 3 (commencing with Section 35650) of Chapter 5 for the purpose of determining the maximum kingpin to rear axle length, which shall be

not less than 38 feet, that the highway or highway segment can sustain without unreasonable threat to the safety of the public. Upon the basis of the findings, the Director of Transportation shall declare in writing the maximum kingpin to rear axle lengths which can be maintained with safety upon the highway. Following the declaration of maximum lengths as provided by this subdivision, the Department of Transportation shall erect suitable signs at each end of the affected portion of the highway and at any other points that the Department of Transportation determines to be necessary to give adequate notice of the length limits.”

CVC Section 35401.5 incorporates the National Network requirements into California law. There is no overall length limit on the National Network and terminal access routes in accordance with the following CVC sections:

CVC Section 35401.5(a)(1) states that the length of the semitrailer in exclusive combination with a truck tractor does not exceed 48 feet. A semitrailer not more than 53 feet in length shall satisfy this requirement when configured with two or more rear axles, the rearmost of which is located 40 feet or less from the kingpin or when configured with a single axle which is located 38 feet or less from the kingpin.

CVC Section 35401.5(a)(2) states that when a truck tractor, semitrailer and trailer are used in combination, neither the length of the semitrailer nor the length of the trailer shall exceed 28 feet 6 inches.

EVALUATION CRITERIA

The basic criteria for mainline evaluation is that trucks must be able to stay on the paved width available (lane width plus paved shoulder in their direction of traffic). Offtracking computer software in conjunction with highway as-built plans, aerial photos logs, survey data, field reviews and engineering judgement are used in evaluating the highway geometrics for truck access and use.

Offtracking

The definition of offtracking as described in the *Highway Design Manual*.

“Any vehicle whether car, bus, truck, or combination tractor semi-trailer traveling around a circular curve will sweep a wider path than the width of the vehicle. The steering axle, controlled by the driver, can generally follow a circular curve, but the following axles (or trailers) will swing inward toward the center of the curve sweeping a wide path defined by the wheel tracks of the outside front wheel and the inside rear wheel. The difference between the swept width and the vehicle width is referred to as offtracking.”

Computer Model – AutoTURN®

AutoTURN[®] is a computer aided design (CAD) based program that simulates low speed turning maneuvers for highway vehicles and aircraft. This program calculates the location and orientation of the vehicle as it is steered along a pre-defined path and can be used to determine vehicle tire tracking and swept paths. The path is that of the center of the vehicle steering axle, and is drawn in the CAD environment. AutoTURN[®] comes with complete sets of standard vehicles including the Caltrans Standard Vehicles, as defined in the *Highway Design Manual Figure 404.2* (The California Design Vehicle is shown on Exhibit 4). This program was used to evaluate the extent of offtracking for trucks with specific KP-RA lengths of 12.19 m (40 ft), 11.58 m (38 ft) and 9.14 m (30 ft) along SR-94 within the study limits. These computer simulation runs were able to show how much roadway width was needed for the different size trucks to negotiate the highway at the identified curve locations without crossing the centerline, and was used in determining the roadway widening and realignment for Alternative 3.

ALTERNATIVES

Alternative 1 – No Action

This alternative would maintain the existing 9.14 m (30 ft KP-RA) advisory signs on SR-94. This alternative does not address the problem with the existing nonstandard roadway geometrics, and would only be effective if the trucks using the route were restricted to the maximum advised length. With this alternative, as the traffic volume increases, so could the potential for truck and automobile accidents if the same types of trucks (longer than the advised maximum) continue using this route.

Alternative 2 – Restrict Trucks to Maximum (KP-RA) length of 11.58 m (38 ft)

This alternative proposes to restrict trucks on Route 94 with KP-RA length greater than 11.58 m (38 ft). The CVC permits Caltrans to restrict the (KP-RA) length of truck tractor-semitrailers to not less than 11.58 m (38 ft).

This alternative also does not address the problem with the existing roadway geometrics and only partially addresses the truck length problem because SR-94 has segments where trucks with 11.58m (38 ft) KP-RA length would not be able to negotiate the roadway without offtracking. Since this alternative does not change the existing roadway geometrics, the route would continue to be posted with the 9.14 m (30 ft) KP-RA advisory signs.

In addition, this alternative does not necessarily reduce the number of trucks currently using the route. The configuration of the typical truck tractor-semitrailer allows the KP-RA setting to be adjusted from the 12.19 m (40 ft) to the 11.58 m (38 ft). By eliminating the longer trucks without this capability, this alternative may put more shorter length trucks on the route to carry the same load and the potential for truck and automobile accidents could increase as traffic volumes increase. This alternative may also prompt the trucking industry to use different type trucks, such as the truck-tractor semitrailer-trailer combination, whose offtracking characteristics would likely be less than that of the truck-tractor semitrailer combination.

Alternative 3 - Widening and Realignment

This alternative proposes to revise the existing roadway to standard geometrics as outlined in Section 307 of the *Highway Design Manual* and the *Design Information Bulletin Number 79 – Geometric Design Criteria for Resurfacing Restoration and Rehabilitation Projects* (RRR). This alternative addresses both issues of nonstandard geometrics and truck length by upgrading the roadway to accommodate trucks with KP-RA length of 12.19 m (40 ft) for the segment of Route 94 from Otay Lakes Road KP 39.7 (PM 24.7) to State Route 188 KP 62.6 (PM 38.9).

RRR design criteria apply to bridge and pavement projects on two-lane conventional highways for certain operational improvements and safety funded nonfreeway projects. These criteria apply to geometric design features such as lane and shoulder widths, horizontal and vertical alignment, cross slope, superelevation, side slope and clear recovery zone. The RRR criteria were used in the preliminary design to upgrade the areas where trucks were offtracking. To reduce environmental impacts, the preliminary design for these locations minimized the proposed cut areas. The studies indicate a small difference in the amount of grading required to accommodate the trucks with 12.19 m (40 ft) KP-RA lengths versus the grading needed for the trucks with 11.58 m (38 ft) KP-RA lengths. The proposed typical cross sections are shown on Exhibits 5, 6 and 7 and summarized in the table below:

LOCATION	EXISTING CURVE RADIUS ± m / (ft)	EXISTING CURVE LENGTH ± m / (ft)	PAVEMENT WIDENING REQUIRED ± m / (ft)	MAXIMUM CUT PROPOSED ± m / (ft)	MAXIMUM FILL PROPOSED ± m / (ft)
A	181.7 m (596 ft)	67.4 m (221 ft)	1.6 m (5.2 ft)	none	none
B	108. m (356 ft)	75.0 m (246 ft)	2.2 m (7.2 ft)	none	none
C	62.8 - 91.4 m (206 – 300 ft)	47.9- 94.8 m (157 – 311 ft)	1.7 m (5.6 ft)	none	1.2 m (4 ft)
D	36.6 - 40.8 m (120 – 134 ft)	36.0 - 41.6 m (118 – 137 ft)	1.2 m (3.9 ft)	none	1.2 m (4 ft)

LOCATION	EXISTING CURVE RADIUS ± m / (ft)	EXISTING CURVE LENGTH ± m / (ft)	PAVEMENT WIDENING REQUIRED ± m / (ft)	MAXIMUM CUT PROPOSED ± m / (ft)	MAXIMUM FILL PROPOSED ± m / (ft)
E	54.9 m (180 ft)	72.2 m (237 ft)	2.2 m (7.2 ft)	none	1.4 m (4.5 ft)
F	109.7 m (360 ft)	113.9 m (374 ft)	2.1 m (6.9 ft)	none	none
G	76.2 m (250 ft)	52.1 m (171 ft)	2.8 m (9.2 ft)	9.1 m (30 ft)	none
H	60.9 – 83.8 m (200 – 275 ft)	51.4 – 96.5 m (169 – 317 ft)	4.8 m (15.6 ft)	10.7 m (35 ft)	6 m (16.4 ft)

Location A – KP 41.0 – KP 41.2 (PM 25.5 – PM 25.6)

This is the only location that is within the limits of the proposed passing lane project (EA 165740) for SR-94. The proposed design shown in Exhibit 5 is for a short segment of the roadway; revising the horizontal curve alignment and widening to minimum lane and shoulder width standards without requiring additional right of way. This design has minimal environmental impacts as compared to the design in the proposed passing lane project for this curve. The proposed passing lane project utilizes full geometric standards for lane and shoulder widths which require additional right of way.

Location B – KP 43.0 – KP 43.1 (PM 26.7 – PM 26.8)

The curve at this location requires realignment and roadway widening but does not require additional right of way. At this location there are existing oak trees adjacent to the roadway. Environmental impacts will be mitigated.

Location C – KP 43.6 – KP 43.9 (PM 27.1 – PM 27.3)

Location D – KP 43.9 - KP 44.1 (PM 27.3 – PM 27.4)

Location E – KP 44.3 - KP 44.4 (PM 27.5 – PM 27.6)

These locations have a series of horizontal curves connected with very short or no tangent sections in steep mountainous terrain. The curves require realignment and roadway widening. To minimize any cut areas, the proposed widening for these locations utilizes retaining walls for fill areas. Several types of walls have been proposed, including soldier pile walls and crib walls. The type of wall selected will depend on several factors such as: soil/rock characteristics and required wall height. Environmental impacts will be mitigated.

Location F – KP 45.7 - KP 45.9 (PM 28.4 – PM 28.5)

The curve at this location requires widening which can be done within the existing right of way. There should be no major grading impacts since there are flat unpaved areas adjacent to both sides of the roadway that can accommodate the widening at this location.

Location G – KP 46.7 - KP 46.8 (PM 29.0 – PM 29.1)

The curve at this location is the most severe of the areas being studied. The roadbed at the narrowest is 19 ft wide. The proposed widening will require additional right of way and result in a cut area approximately 91 m (300 ft) in length with a maximum cut height of approximately 9.1 m (30 ft). At this location the lanes are less than 3.65 m (12 ft) with shoulders less than 0.30 m (1 ft). There is a stream along the south side of the roadway, and a hillside to the north, (Exhibit 7). Several trees line the embankment along the streambed. The hillside on the other side of roadway is sparsely vegetated, with exposed rock outcroppings. These factors influenced the proposed widening to cut into the existing hillside to reduce the impact to the streambed and the surrounding vegetation, which may include environmentally sensitive areas (ESA).

From preliminary geotechnical investigation, grading for this location will require blasting to remove the rock for the roadway widening. Construction methods to avoid debris from entering any ESA adjacent to the stream should be implemented for this location.

Location H – KP 59.7 - KP 60.7 (PM 37.1 – PM 37.7)

This location has a series of nine horizontal curves connected with very short or no tangent sections in steep mountainous terrain. It encompasses a segment of the highway that is approximately 966 m (3200 ft) long. The curves require realignment and roadway widening.

The preliminary geotechnical investigation for this segment of SR-94 recommended a 1.5H :1V maximum cut slope. To minimize any cut areas, the proposed widening for these locations utilizes retaining walls for fill areas. Several types of walls have been proposed, including soldier pile walls and crib walls. The type selected will depend on several factors which include, but are not restricted to: soil/rock characteristics, wall height required and any environmental impacts that will need to be mitigated. The proposed preliminary design has areas with cut slope heights varying from 4.2 m to 10.7 m (14 ft – 35 ft) for a distance of 20 m - 45 m (66 ft – 148 ft) along the roadway for each area. This would total approximately 140 m (460 ft) of cut length. The wall heights for the fill areas in the proposed preliminary design range from 0.91 m to 6.1 m (3 ft – 20 ft) along the north side of the roadway varying in length from 100 m – 300 m (328 ft – 985 ft) for each section of fill.

The amount of cut can be reduced through further refined design. However, if this is done the fill areas would increase and probably be continuous throughout the length of this series of curves. In depth geotechnical studies are required for more detailed engineering. The type of rock and soil will dictate the best engineering strategy to use for this location.

SUMMARY

This report concludes that State Route 94 from Otay Lakes Road KP 39.7 (PM 24.7) to State Route 188 KP 62.6 (PM 38.9) has nonstandard sections of roadway that inhibit the ability of truck tractor-semitrailers with KP-RA length over 9.1 m (30 ft) to negotiate the highway without crossing the centerline or going off the existing edge of pavement.

To address this issue, three alternatives have been discussed: 1) No action proposed and keep the existing 9.1 m (30 ft) advisory signs in place, 2) Restrict the length of trucks using the highway to 11.6 m (38 ft), the legal restriction limit per the CVC, and 3) Revise the roadway geometrics by realigning the nonstandard curves and widening the traveled way so the highway can accommodate the length of truck that is legally allowed.

Further studies are required to address the environmental issues and processes related to alternative 3. These studies should be consistent with the other safety and operational improvement projects currently being developed for the Route 94 corridor.

RECOMMENDATIONS

It is recommended that future activities related to the segment of SR-94 evaluated in this study be categorized as immediate, intermediate and future goals.

The recommended immediate goal is to implement Alternative 1 (keep the existing 9.1 m (30 ft) advisory signs in place) with a high level of surveillance by the CHP, and delete Alternative 2. The 11.6 m (38 ft) regulatory sign would likely add confusion for the motorist when used in conjunction with the 9.1 m (30 ft) advisory sign. Additionally, the 11.6 m (38 ft) restriction would decrease the load capacity of trucks and thereby cause an increase in the number of trucks using this segment of the highway.

The recommended intermediate goal is to implement portions of Alternative 3; pursue an operational improvement project to address the areas within Locations A through G that can be accomplished within the confines of the Categorical Exemption/Categorical Exclusion environmental process.

The recommended future goal is to diligently pursue the appropriate environmental document for a project that improve Location H and areas in Locations A through G not addressed in the intermediate goal.

REFERENCES

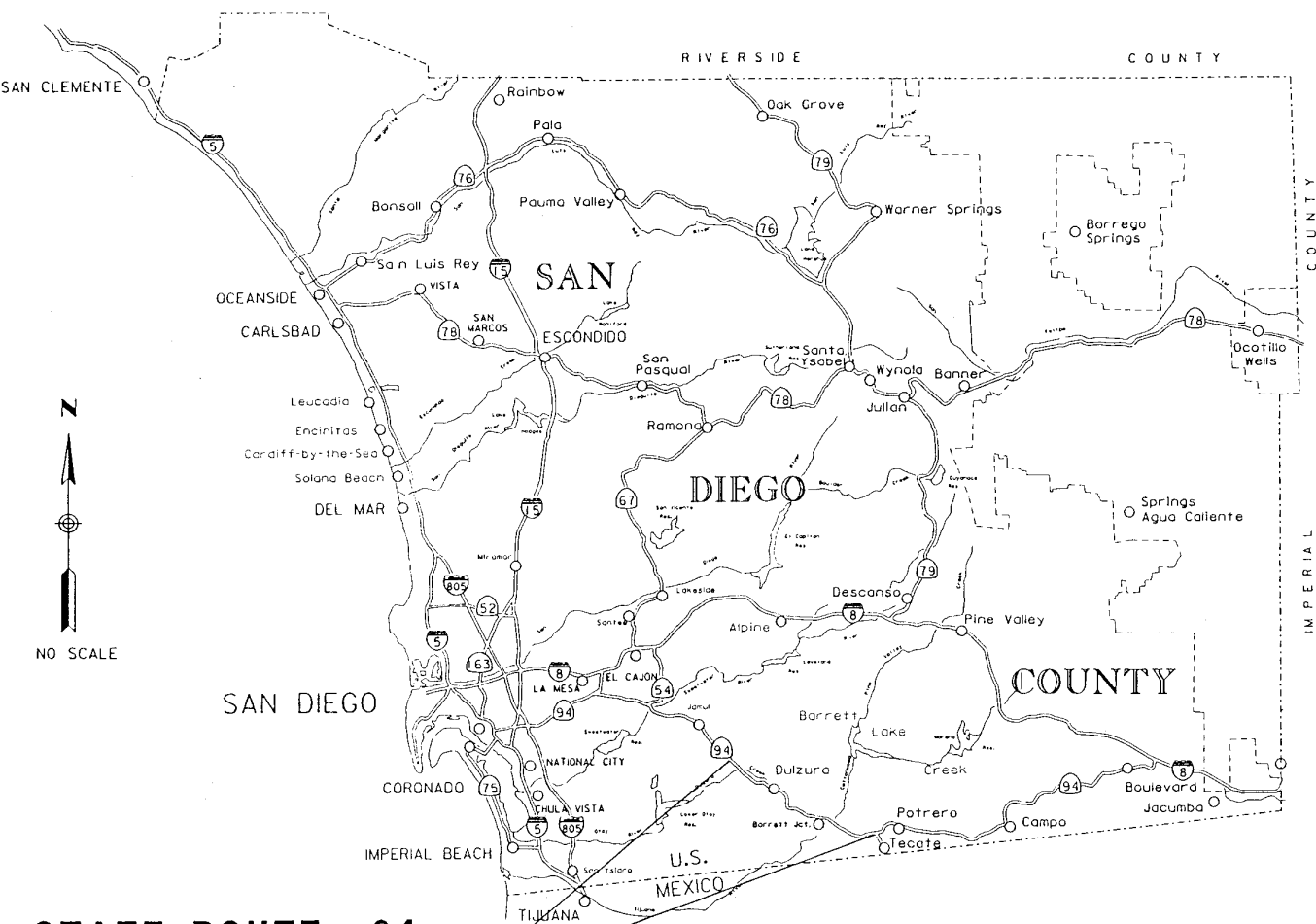
- 1) "Truck Restrictions, Overview of Existing Authority and Procedures Pertaining to Truck Restrictions", February 1994 Draft
- 2) "State of California 1998 Vehicle Code Through the 1997 Legislative Session"
- 3) "Highway Design Manual" Fifth Edition
- 4) "Route Concept Report State Route 94" January 1991
- 5) "State Route 94 Corridor Study – Phase 1" March 1997

- 6) “State Route 94 Passing Lanes San Diego County, Negative Declaration Finding of No Significant Impact” May 1998
- 7) “Technical Report State Route 94 Corridor, Tecate Port of Entry: Trade and Truck Traffic” July 9, 1997 SANDAG
- 8) “Traffic Volumes” California State Highways District 11, 1984-1997
- 9) “1996 Annual Average Daily Truck Traffic on the California State Highway System”, October 1997
- 10) Map titled “Truck Networks on California State Highways”, January 1998
- 11) “Truck Kingpin to Rear Axle Length State Highway System Evaluation Report”, December 1989
- 12) “Truck Networks and Offtracking Analysis”, Caltrans, September 1994
- 13) “AutoTURN[®] Version 3.0 User’s Guide, Revised August 1997

EXHIBITS

- 1) Vicinity Map – San Diego County
- 2) Location Map / Aerial Photographs – State Route 94
- 3) Truck Diagram – Tractor / Semitrailer Terminology
- 4) Design Vehicles – Highway Design Manual
- 5) Alternative 3 - Typical Cross Section - Locations A, B & F
- 6) Alternative 3 - Typical Cross Section - Locations C, D, E & H
- 7) Alternative 3 - Typical Cross Section - Location G

APPENDIX A California Vehicle Code (Sections 35400-35414)



STATE ROUTE 94 TRUCK STUDY LIMITS

KP 39.8 - KP 62.7
(PM 24.7 - PM 38.9)

Exhibit 1

TRACTOR/SEMITRAILER TERMINOLOGY

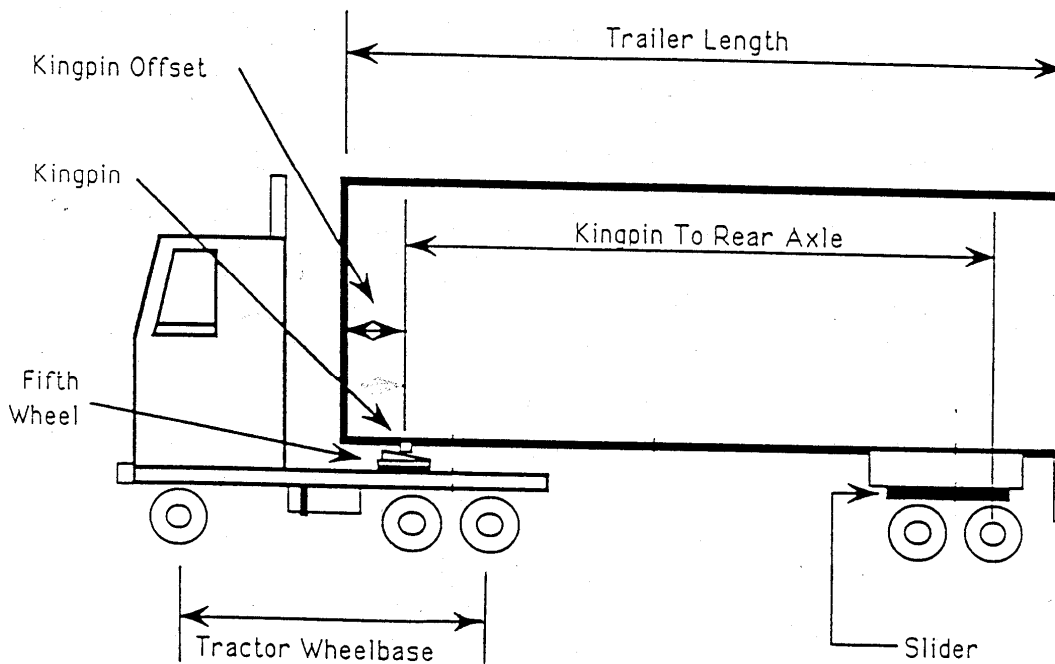
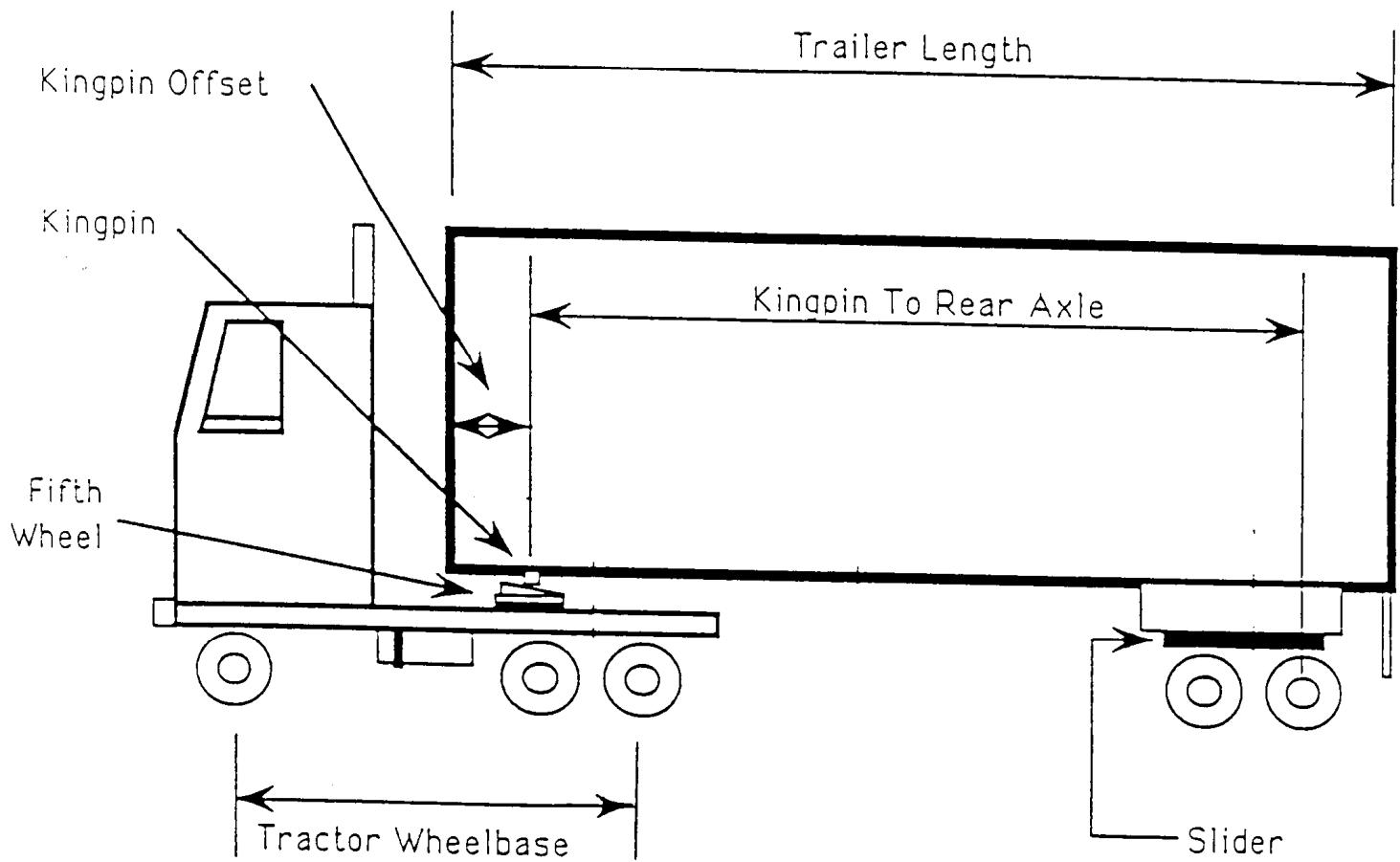
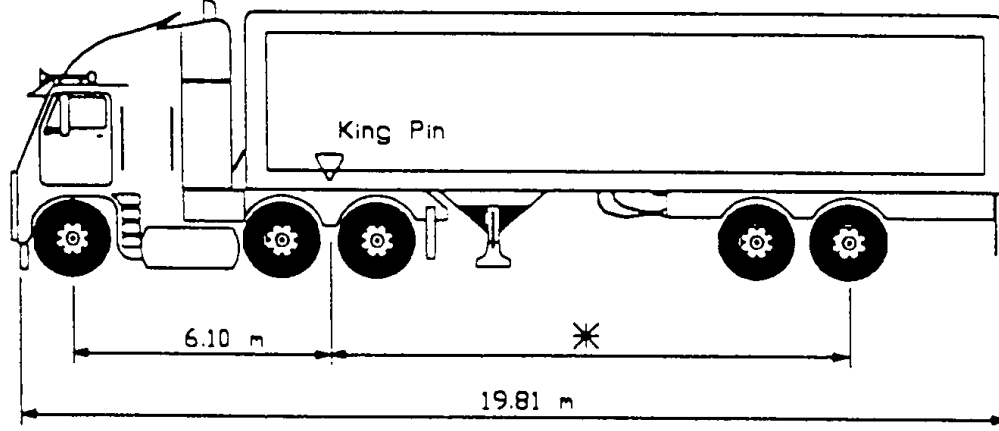


Exhibit 3

TRACTOR/SEMITRAILER TERMINOLOGY





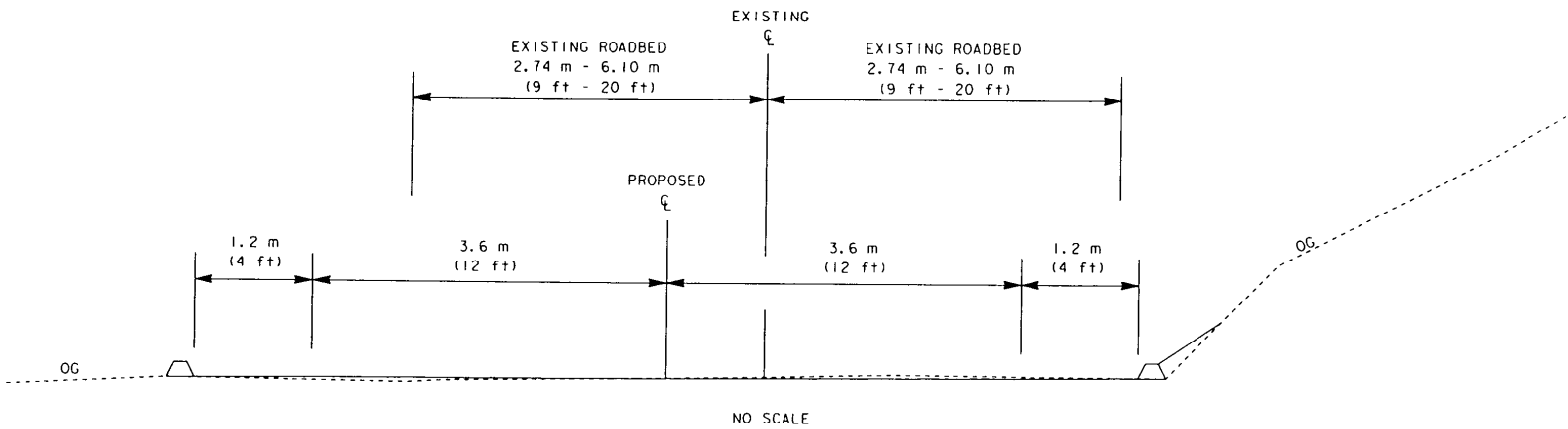
* 12.19 m two or more axles
11.58 m one axle

California Design Vehicle

Exhibit 4

TRUCK RESTRICTION STUDY

STATE ROUTE 94



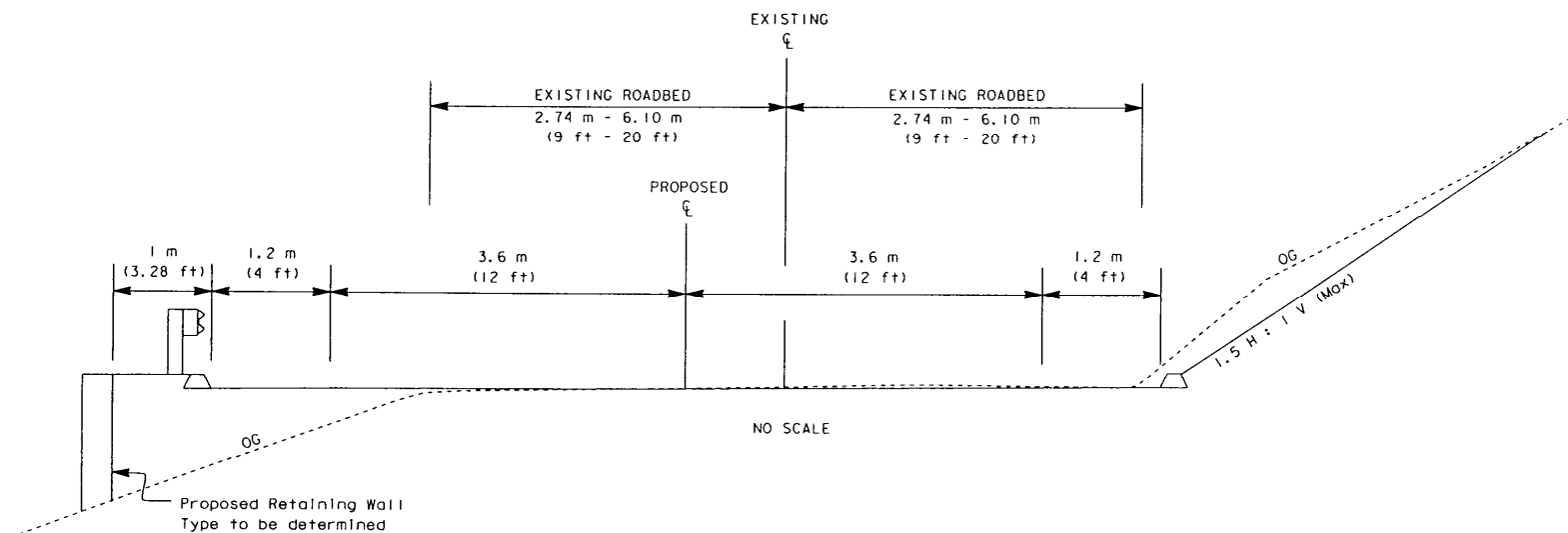
ALTERNATIVE 3 TYPICAL CROSS SECTION

WIDENING ONLY LOCATIONS A,B&F

Exhibit 5

TRUCK RESTRICTION STUDY

STATE ROUTE 94



ALTERNATIVE 3 TYPICAL CROSS SECTION

CUT / FILL
LOCATIONS C,D,E&H

Exhibit 6

STATE ROUTE 94

EXISTING ROADBED
2.74 m - 5.79 m
(9 ft - 19 ft)

EXISTING ROADBED
3.05 m - 5.79 m
(10 ft - 19 ft)

PROPOSED ROADBED
1.2 m (4 ft) - 3.6 m (12 ft) - 3.6 m (12 ft) - 1.2 m (4 ft)

0.5 H : 1 V (Max)

NO SCALE

(POTENTIAL EROSION)
DULZURA CREEK

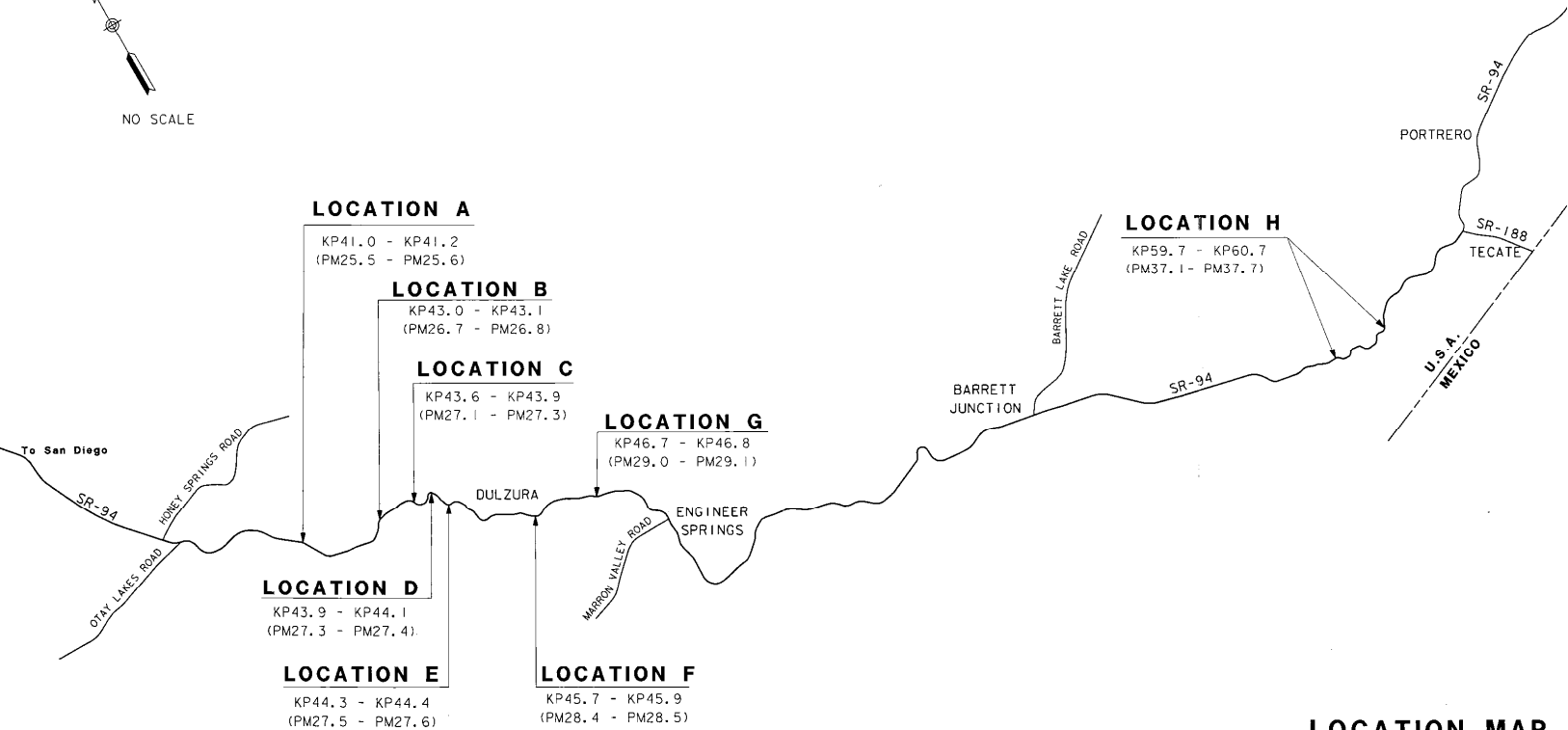
CUT
LOCATION G

Exhibit 7

TRUCK RESTRICTION STUDY STATE ROUTE 94



NO SCALE



LOCATION MAP
Exhibit 2

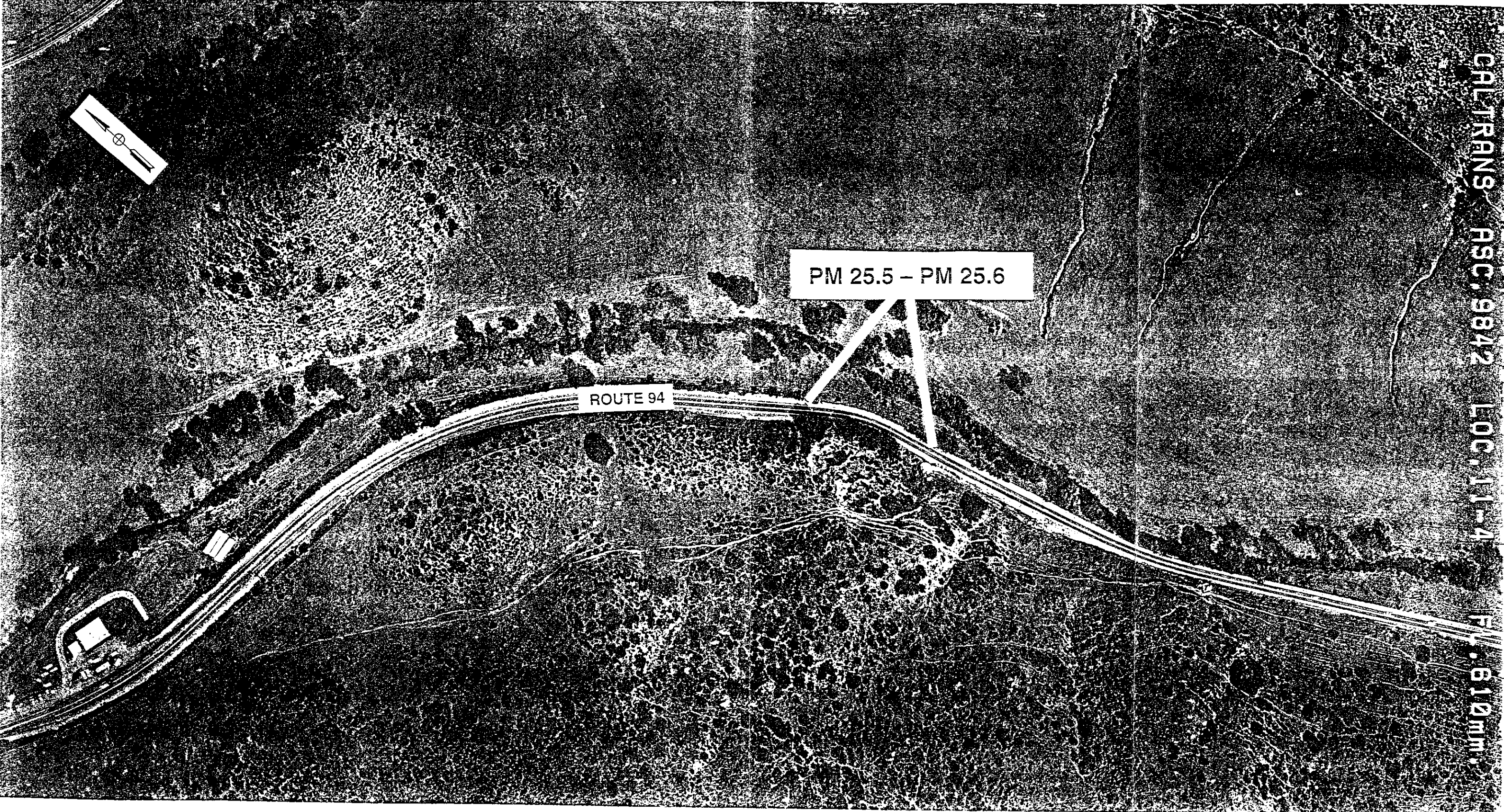
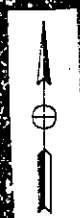


Exhibit 2
(LOCATION A)



PM 26.7 - PM 26.8

ROUTE 94

CALTRANS, ASB 9842, L22-11-4, FL 612m

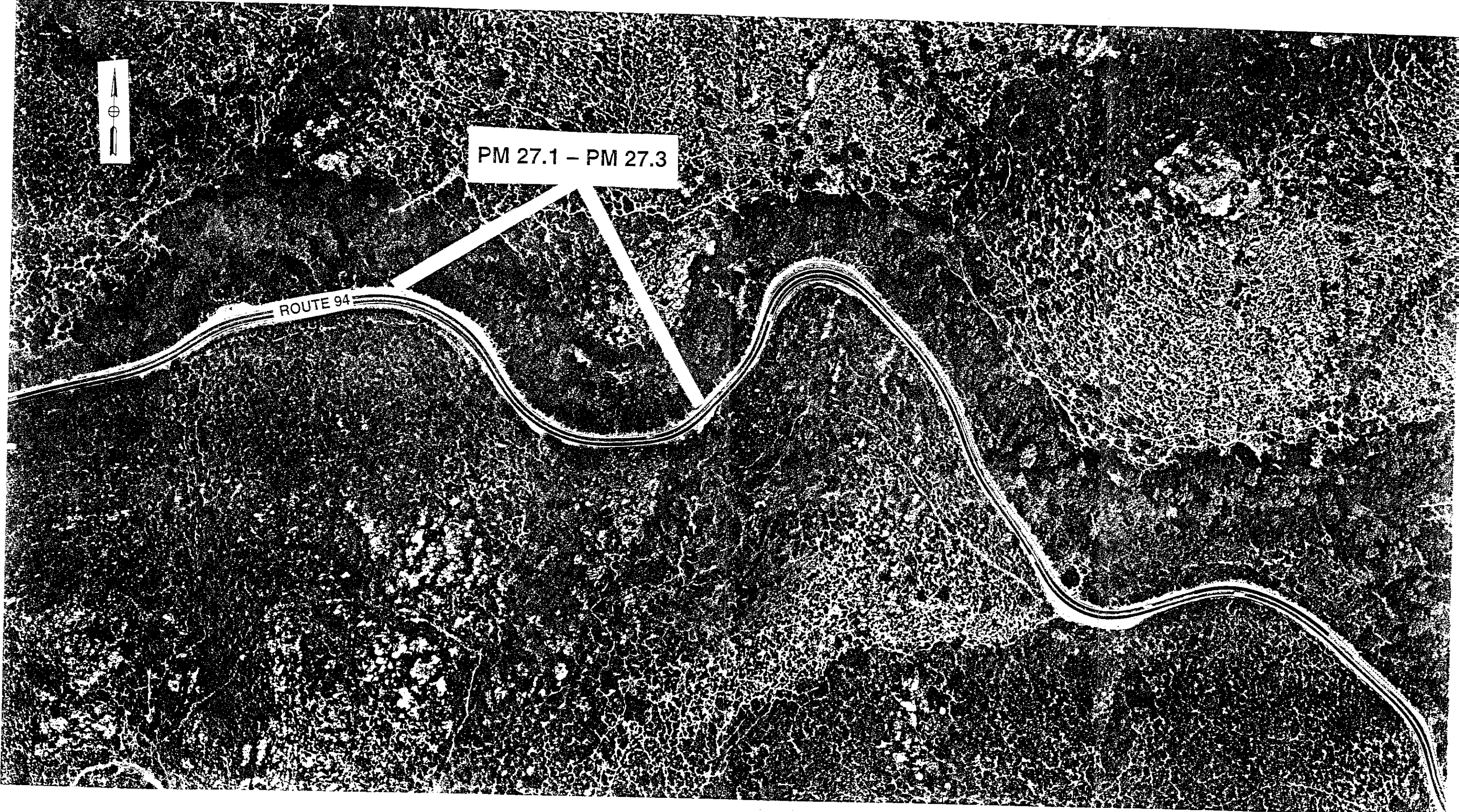


Exhibit 2
(LOCATION C)

CALTRANS ASC: 9842 LPC: 11-4 FL: 610mm.

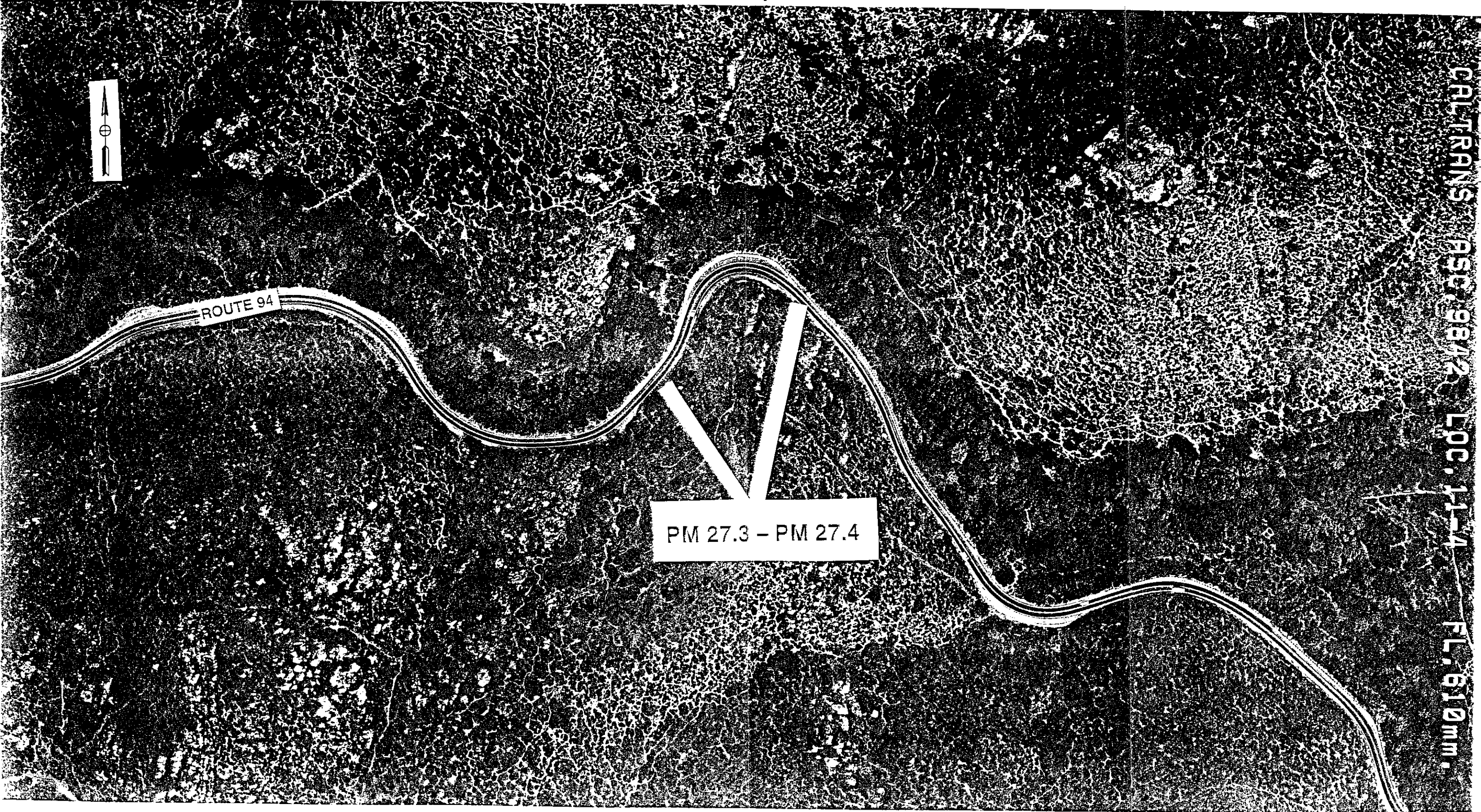


Exhibit 2
(LOCATION D)

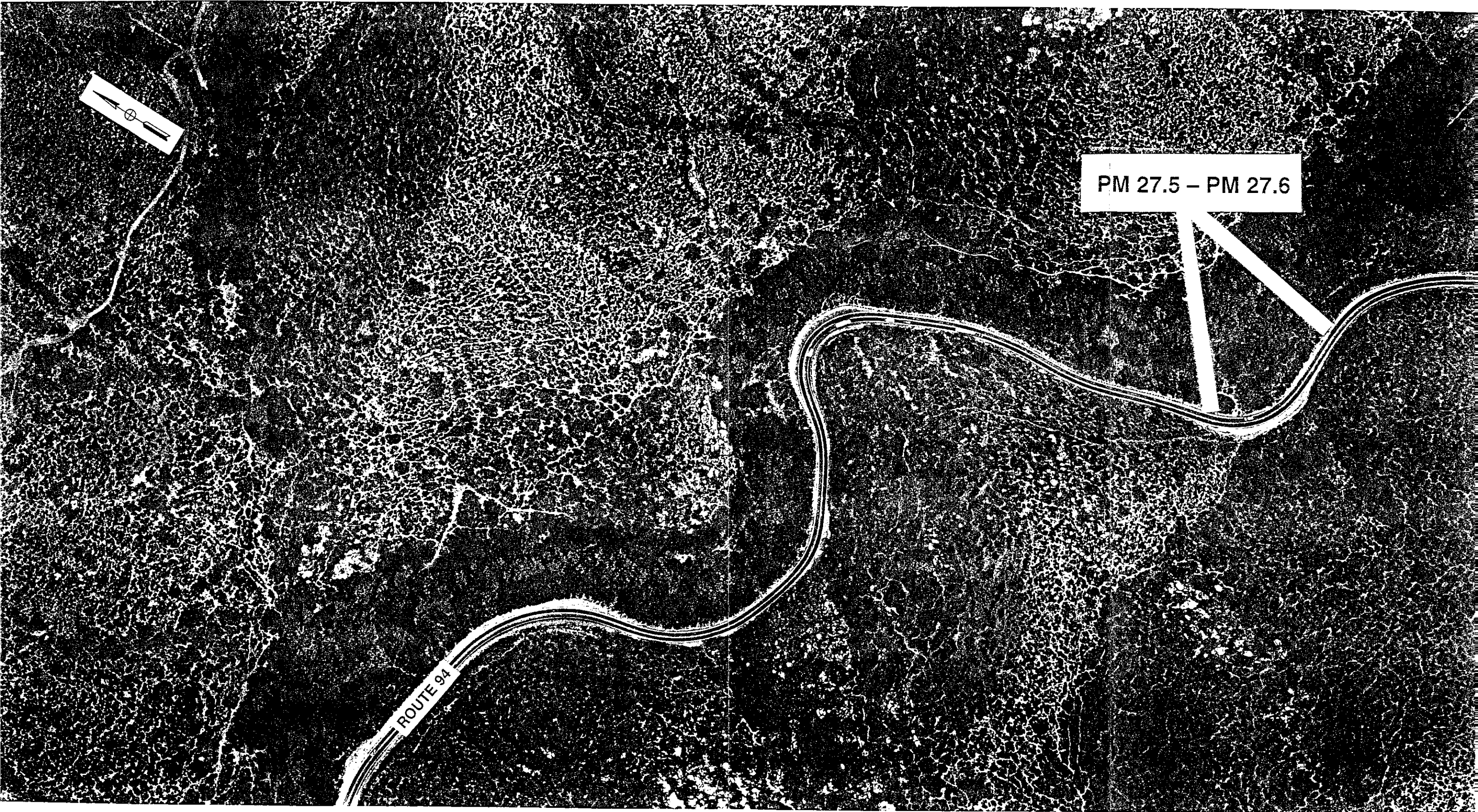
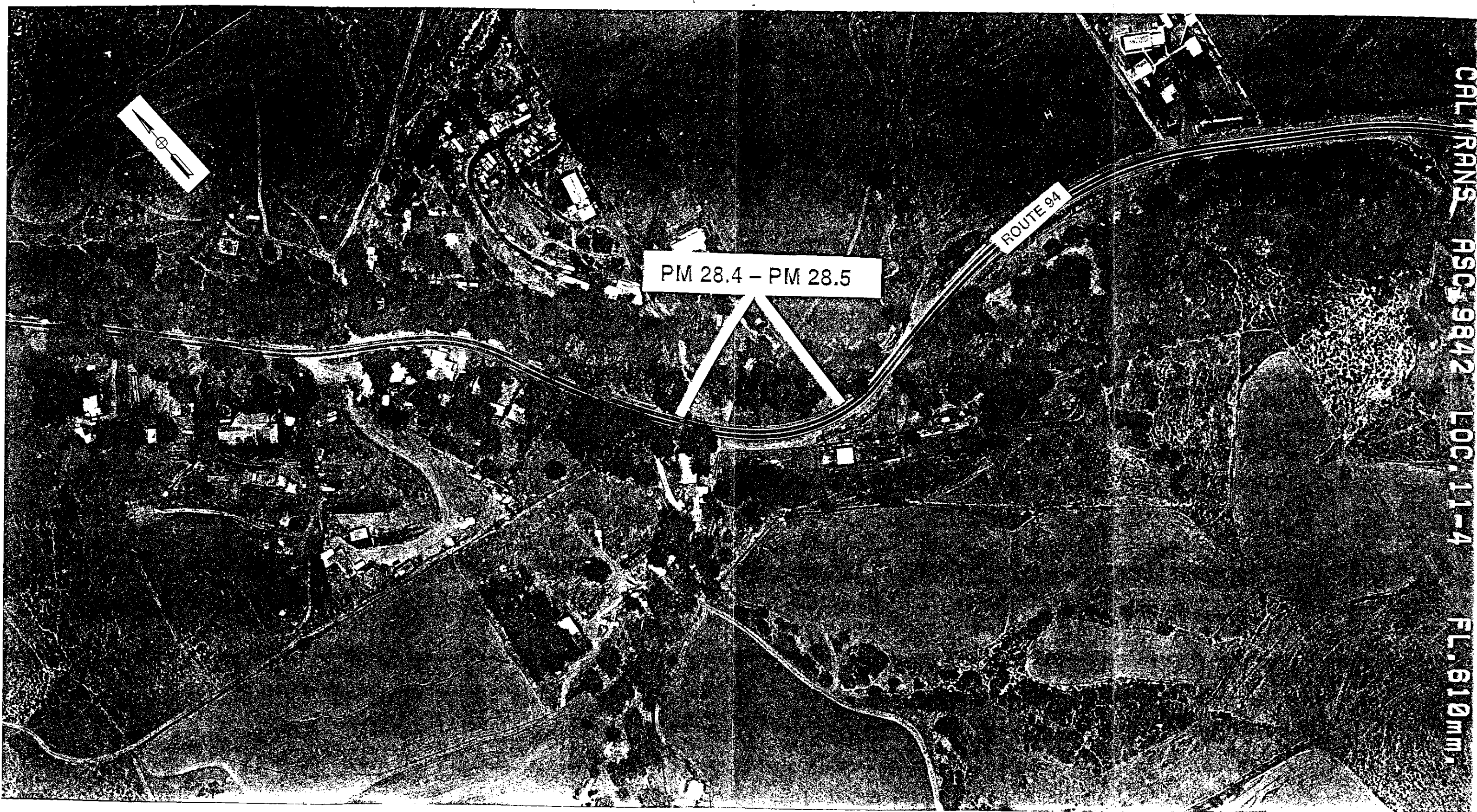


Exhibit 2
(LOCATION E)



CALTRANS ASC 9842 LOC. 11-4 FL. 610mm.

Exhibit 2
(LOCATION F)

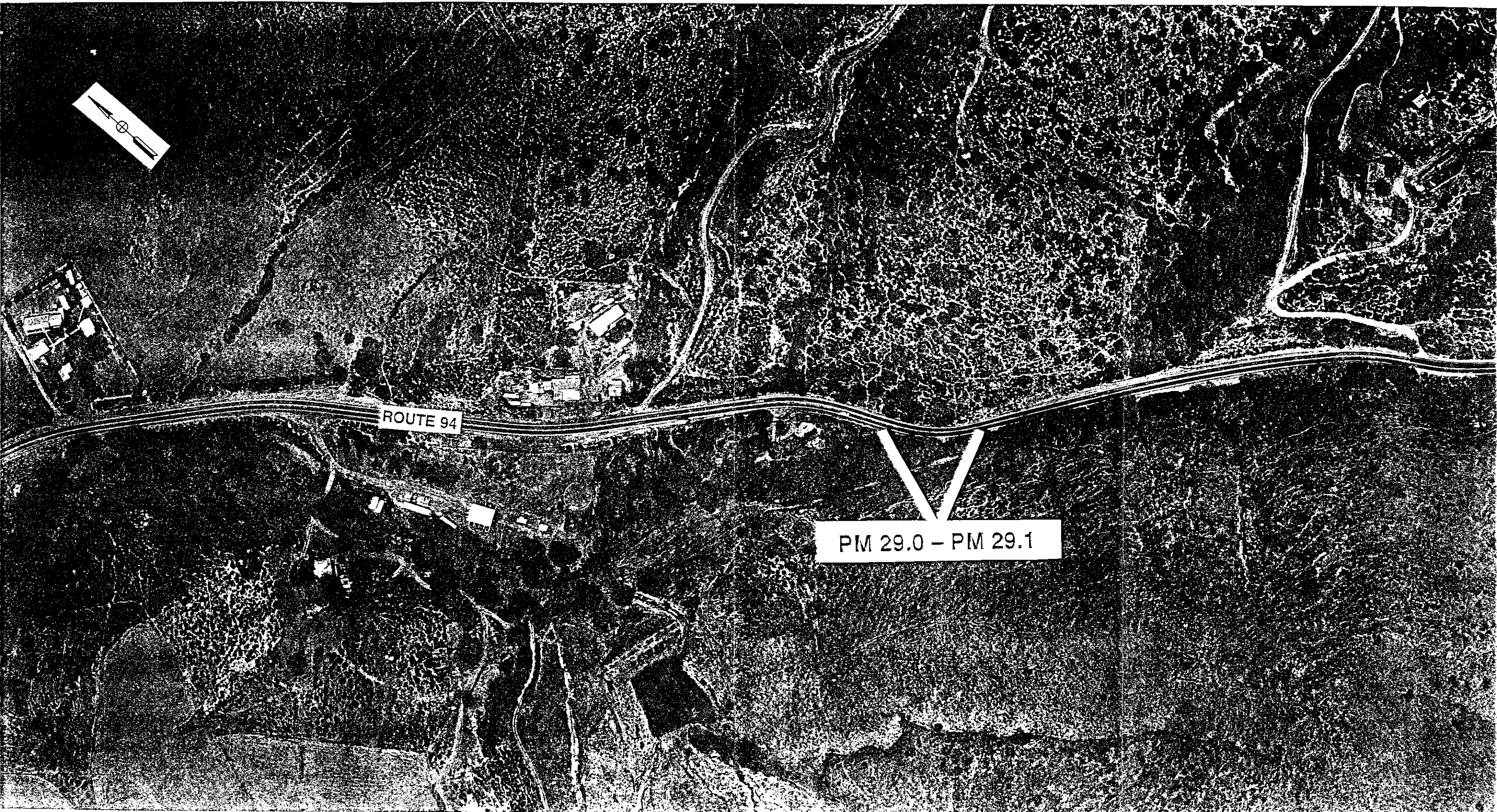


Exhibit 2
(LOCATION G)

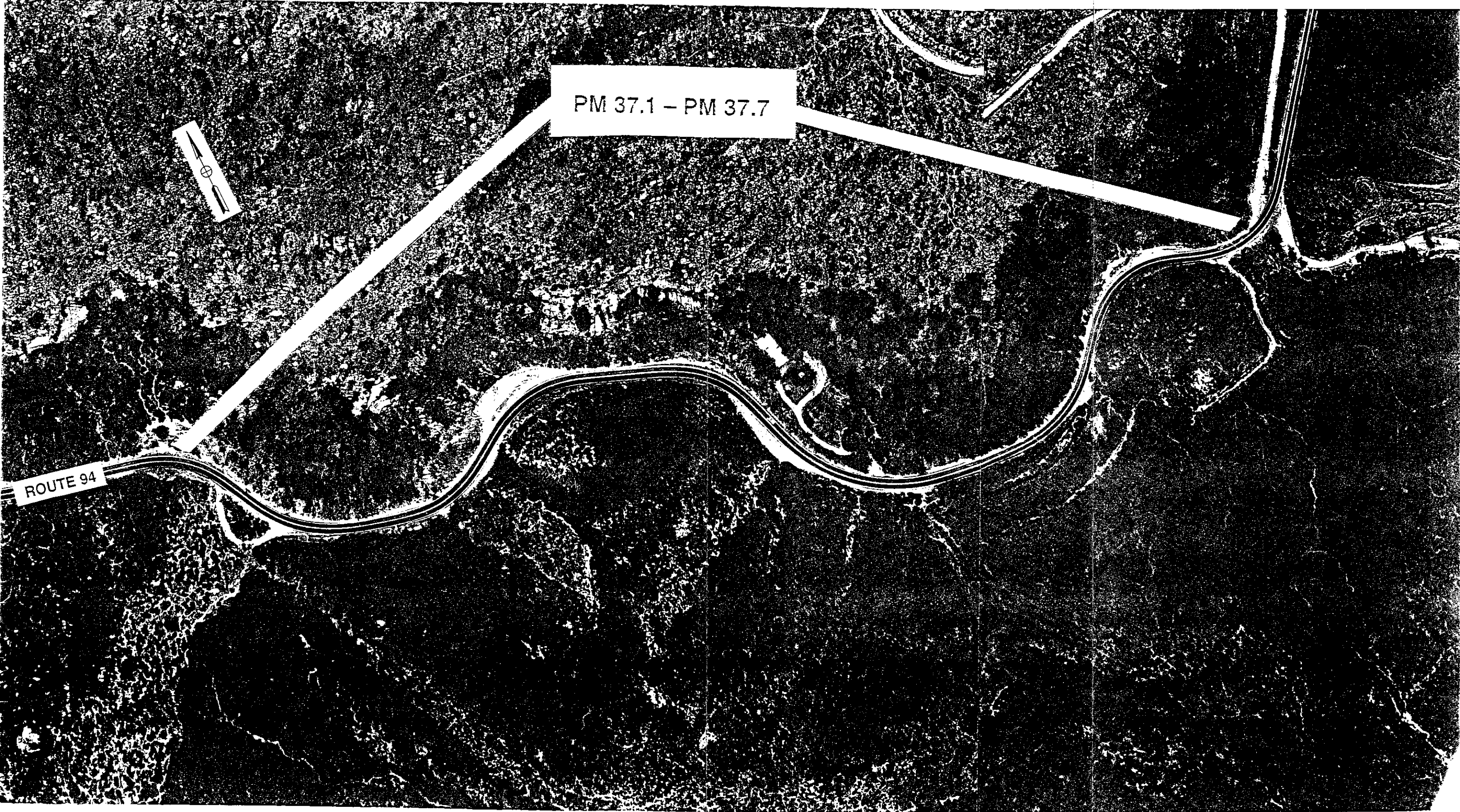


Exhibit 2
(LOCATION H)

APPENDIX A

STATE OF CALIFORNIA 1998 CALIFORNIA VEHICLE CODE

**DIVISION 15. SIZE, WEIGHT, AND LOAD
CHAPTER 4. LENGTH**

(35400 – 35414)

VEHICLE CODE
SECTION 35400-35414

35400. (a) No vehicle shall exceed a length of 40 feet.

(b) This section does not apply to any of the following:

(1) A vehicle used in a combination of vehicles when the excess length is caused by auxiliary parts, equipment, or machinery not used as space to carry any part of the load, except that the combination of vehicles shall not exceed the length provided for combination vehicles.

(2) A vehicle when the excess length is caused by any parts necessary to comply with the fender and mudguard regulations of this code.

(3) An articulated bus or articulated trolley coach which does not exceed a length of 60 feet.

(4) A semitrailer while being towed by a motortruck or truck tractor, if the distance from the kingpin to the rearmost axle of the semitrailer does not exceed 40 feet for semitrailers having two or more axles, or 38 feet for semitrailers having one axle if the semitrailer does not, exclusive of attachments, extend forward of the rear of the cab of the motortruck or truck tractor.

(5) A bus when the excess length is caused by the projection of a front safety bumper or a rear safety bumper, or both. The safety bumper shall not cause the length of the vehicle to exceed the maximum legal limit by more than one foot in the front and one foot in the rear. For the purposes of this chapter, "safety bumper" means any device which is fitted on an existing bumper or which replaces the bumper and is constructed, treated, or manufactured to absorb energy upon impact.

(6) A bus when the excess length is caused by a device, located in front of the front axle, for lifting wheelchairs into the bus. That device shall not cause the length of the bus to be extended by more than 18 inches, inclusive of any front safety bumper.

(7) A bus when the excess length is caused by a device attached to the rear of the bus designed and used exclusively for the transporting of bicycles. This device may be up to 10 feet in length, if the device, along with any other device permitted pursuant to this section, does not cause the total length of the bus, including any device or load, to exceed 50 feet.

(8) A bus operated by a public agency or a passenger stage corporation, as defined in Section 226 of the Public Utilities Code, used in transit system service, other than a schoolbus, when the excess length is caused by a folding device attached to the front of the bus which is designed and used exclusively for transporting bicycles. The device, including any bicycles transported thereon, shall be mounted in a manner that does not materially affect efficiency or visibility of vehicle safety equipment, and shall not extend more than 36 inches from the front of the bus when fully deployed. The handlebars of a bicycle that is transported on a device described in this paragraph shall not extend more than 42 inches from the front of the bus. A device described in this paragraph may not be used on any bus which, exclusive of the device, exceeds 40 feet in length or on any bus having a device attached to the rear of the bus pursuant to paragraph (7).

(9) A bus of a length of up to 45 feet when operating on those highways specified in subdivision (a) of Section 35401.5. The Department of Transportation or local authorities, with respect to highways under their respective jurisdictions, shall not deny reasonable access to a bus of a length of up to 45 feet between the highways specified in subdivision (a) of Section 35401.5 and points

vehicle operated alone, or the load upon the front vehicle of a combination of vehicles, shall not extend more than three feet beyond the foremost part of the front tires of the vehicle or the front bumper of the vehicle, if it is equipped with a front bumper.

(b) When the load is composed solely of vehicles, the load upon the front vehicle of a combination of vehicles shall not extend more than four feet beyond the foremost part of the front tires of the vehicle or the front bumper of the vehicle, if it is equipped with a front bumper.

35407. Section 35406 does not apply to the booms or masts of shovels, cranes or water well drilling and servicing equipment carried upon a motor vehicle if the following conditions are met:

(a) The booms or masts shall not extend more than two-thirds of the wheelbase beyond the front tires of such vehicle.

(b) The projecting structure or attachments thereto shall be securely held in place to prevent dropping or swaying.

(c) No part of the structure which extends beyond the front tires shall be less than seven feet from the roadway.

(d) The driver's vision shall not be impaired by the projecting or supporting structure.

35407.5. Section 35406 and subdivisions (a) and (d) of Section 35407 do not apply to the booms or masts of a self-propelled heel-boom log loader first sold in this state prior to January 1, 1988, if all of the following conditions are met:

(a) A system of mirrors or other view enhancements permits the driver to see in any area blocked from view.

(b) The log loader is operated together with a four wheeled lead vehicle which remains a reasonable distance ahead to guide the movement of the log loader.

(c) Two-way radio communication equipment is maintained in good working condition on the log loader and the pilot car, and is used between those vehicles during movement upon any highway.

35408. In no event shall a front bumper on a motor vehicle be constructed or installed so as to project more than two feet forward of the foremost part of either the fenders or cab structure or radiator, whichever extends farthest toward the front of such vehicle.

35409. (a) Any motor vehicle used for the purpose of taking photographs, motion pictures, or television pictures or for teaching safe driving may be equipped with a dismountable platform or other device extending forward of either the fenders or cab structure or radiator, whichever extends farthest toward the front of such vehicle, for a distance not exceeding five feet while such vehicle is in use for such purpose.

(b) Any device used for the sole purpose of teaching safe driving, as provided in subdivision (a), shall be of a type authorized by the Department of the California Highway Patrol and the Department of Motor Vehicles.

35410. The load upon any motor vehicle alone or an independent load

18 inches in length on each end of a vehicle or combination of vehicles used exclusively to transport vehicles shall not be included in measuring the length of a vehicle or combination of vehicles when the vehicles are loaded.

(c) Notwithstanding subdivision (a), extensions of not more than 18 inches in length on the last vehicle in a combination of vehicles transporting loads shall not be included in measuring the length of a vehicle or combination of vehicles when the vehicles are loaded.

(d) Notwithstanding subdivision (a), any extension or device which is not used to carry any load and which does not exceed three feet in length, added to the rear of a vehicle, and is used exclusively for pushing the vehicle or a combination of vehicles, which vehicle or combination of vehicles is designed and used exclusively to transport earth, sand, gravel, and similar materials, shall be included in measuring the length of the vehicle but shall not be included in measuring the overall length of the combination of vehicles.

(e) Notwithstanding subdivision (a), a truck semitrailer combination, but not a truck tractor and semitrailer combination, may use a sliding fifth wheel, or a truck tractor, semitrailer, trailer, and a truck-trailer combination may use a sliding drawbar, to extend the length of the combination by not more than 2 feet 6 inches while traveling 35 miles per hour or less on any highway, except a freeway. These provisions shall apply, however, to freeway onramps and offramps and freeway connectors. The sliding fifth wheel or drawbar when extended shall not be included in measuring the overall length of the combination of vehicles if the pivot point of the semitrailer connection is more than two feet to the rear of the center of the rearmost axle of the motortruck or if the distance from the pivot point to the center of the rearmost axle of the semitrailer does not exceed 34 feet.

Combinations of vehicles permitted by this subdivision shall be in compliance with the weight limits provided in Article 1 (commencing with Section 35550) of Chapter 5 whenever any drawbar or sliding fifth wheel is extended, contracted, or in any intermediate position as provided for by this subdivision.

35403. Safety devices which are required to be mounted upon a vehicle pursuant to provisions of this code, may extend beyond the permissible length of a vehicle, or a combination of vehicles, to a distance not exceeding 10 inches.

35404. Any county having a population in excess of 4,000,000 and having within its limits a natural island with an area in excess of 20,000 acres may, by ordinance, prohibit the use of any highway or lane, hereafter established in unincorporated area thereon, (1) by any vehicle exceeding an overall length of 170 inches and an overall width of 65 inches, or (2) by any such vehicle and all vehicles driven by internal combustion engines. Notwithstanding the provisions of Section 906 of the Streets and Highways Code, no such ordinance shall be enacted unless the board of supervisors shall have theretofore adopted, by a four-fifths vote, a resolution determining that the public convenience and necessity require that such highway or lane have a width of 35 feet or less and a roadway width of 22 feet or less.

Any ordinance enacted pursuant to this section shall be subject to Sections 35718 to 35720, inclusive, of this code and shall not apply to authorized emergency vehicles.

shall be deemed automatically approved. Hereafter, the route shall be deemed open for access by all other vehicles of the same type regardless of ownership. In lieu of processing an access application, the Department of Transportation or local authorities with respect to highways under their respective jurisdictions may provide signing, mapping, or a listing of highways as necessary to indicate the use of specific routes as terminal access routes. For purposes of this subdivision, "terminal" means either of the following:

(1) A facility where freight originates, terminates, or is handled in the transportation process.

(2) A facility where a motor carrier maintains operating facilities.

(e) Nothing in subdivision (c) or (d) authorizes state or local agencies to require permits of terminal operators or to charge terminal operators fees for the purpose of attaining access for vehicles described in this section.

(f) Notwithstanding subdivision (d), the limitations of access specified in that subdivision do not apply to licensed carriers of household goods when directly enroute to or from a point of loading or unloading of household goods, if travel on highways other than those specified in subdivision (a) is necessary and incidental to the shipment of the household goods.

(g) (1) Notwithstanding Sections 35400 and 35401, the Department of Transportation or local authorities, with regard to highways under their respective jurisdictions, may, upon application, issue a special permit authorizing the applicant to operate a combination of vehicles consisting of a truck tractor semitrailer combination operated pursuant to subdivision (a) with a kingpin to rearmost axle measurement limit of not more than 46 feet on trailers used exclusively or primarily in connection with motorsports. As used in this paragraph, "motorsports" means any event, and all activities leading up to that event, including, but not limited to, administration, testing, practice, promotion, and merchandising, that is sanctioned under the auspices of the member organizations of the Automobile Competition Committee for the United States.

(2) A local authority, as a condition of issuing a special permit under this subdivision, may establish reasonable controls on the allowable hours of operation of those semitrailers that are authorized to operate under this subdivision.

(h) The Legislature finds and declares both of the following:

(1) In authorizing the use of 53-foot semitrailers, it is the intent of the Legislature to conform with Section 2311(b) of Title 49 of the United States Code by permitting the continued use of semitrailers of the dimensions as those that were in actual and legal use on December 1, 1982, and does not intend this action to be a precedent for future increases in the parameters of any of those vehicles that would adversely affect the turning maneuverability of vehicle combinations.

(2) In authorizing the department to issue special transportation permits for motorsports, it is the intent of the Legislature to conform with Section 31111(b)(1)(E) of Title 49 of the United States Code. It is also the intent of the Legislature that this action not be a precedent for future increases in the distance from the kingpin to the rearmost axle of semitrailers that would adversely affect the turning maneuverability of vehicle combinations.

35402. (a) Any extension or device, including any adjustable axle added to the front or rear of a vehicle, used to increase the carrying capacity of a vehicle shall be included in measuring the length of a vehicle, except that a drawbar shall not be included in measuring the length of a vehicle but shall be included in measuring

kingpin is at least three feet behind the rear drive axle of the motortruck. This combination shall not be subject to subdivision (a) of Section 35411, but the load upon the rear vehicle of the combination shall not extend more than six feet six inches beyond the allowable length of the vehicle.

(b) A combination of vehicles designed and used to transport motor vehicles, which consists of a motortruck and stinger-steered semitrailer, shall be allowed a length of up to 75 feet if all of the following conditions are maintained:

(1) The distance from the steering axle to the rear drive axle of the motortruck does not exceed 24 feet.

(2) The kingpin is at least five feet behind the rear drive axle of the motortruck.

(3) The distance from the kingpin to the rear axle of the semitrailer does not exceed 34 feet except that the distance from the kingpin to the rear axle of a triple axle semitrailer does not exceed 36 feet.

This combination shall not be subject to subdivision (a) of Section 35411, but the load upon the rear vehicle of the combination shall not extend more than six feet six inches beyond the allowable length of the vehicle.

35401.5. (a) A combination of vehicles consisting of a truck tractor and semitrailer, or of a truck tractor, semitrailer, and trailer, is not subject to the limitations of Sections 35400 and 35401, when operating on the National System of Interstate and Defense Highways or when using those portions of federal-aid primary system highways that have been qualified by the United States Secretary of Transportation for that use, or when using routes appropriately identified by the Department of Transportation or local authorities as provided in subdivision (c) or (d), if all of the following conditions are met:

(1) The length of the semitrailer in exclusive combination with a truck tractor does not exceed 48 feet. A semitrailer not more than 53 feet in length shall satisfy this requirement when configured with two or more rear axles, the rearmost of which is located 40 feet or less from the kingpin or when configured with a single axle which is located 38 feet or less from the kingpin. For purposes of this paragraph, a motor truck used in combination with a semitrailer, when that combination of vehicles is engaged solely in the transportation of motor vehicles, is considered to be a truck tractor.

(2) Neither the length of the semitrailer nor the length of the trailer when simultaneously in combination with a truck tractor exceeds 28 feet 6 inches.

(b) Subdivisions (b), (c), (d), and (e) of Section 35402 do not apply to combinations of vehicles operated subject to the exemptions provided by this section.

(c) Combinations of vehicles operated pursuant to subdivision (a) may also use highways not specified in subdivision (a) which provide reasonable access to terminals and facilities for purposes limited to fuel, food, lodging, and repair when that access is consistent with the safe operation of the combinations of vehicles and when the facility is within one road mile of identified points of ingress and egress to or from highways specified in subdivision (a) for use by those combinations of vehicles.

(d) The Department of Transportation or local authorities may establish a process whereby access to terminals or services may be applied for upon a route not previously established as an access route. The denial of a request for access to terminals and services shall be only on the basis of safety and an engineering analysis of the proposed access route. If a written request for access has been properly submitted and has not been acted upon within 90 days of

vehicles regulated by this code.

(2) Actual traffic volume.

(3) Frequency of accidents.

(4) Any other relevant data.

In addition, the city or county may appoint an advisory committee consisting of local representatives of those interests which are likely to be affected and shall consider the recommendations of the advisory committee in adopting the ordinance. The ordinance shall not be effective until appropriate signs are erected indicating the highways or highway portions affected by the ordinance.

This subdivision shall only become operative upon the adoption of an enabling ordinance by a city or county.

(f) Whenever, in the judgment of the Department of Transportation, any state highway cannot, in consideration of public safety, sustain the operation of trailers or semitrailers of the maximum kingpin to rearmost axle distances permitted under Section 35400, the director, in consultation with the Department of the California Highway Patrol, shall compile data on total traffic volume, frequency of use by vehicles covered by this subdivision, accidents involving these vehicles, and other relevant data to assess whether these vehicles are a threat to public safety and should be excluded from the highway or highway segment. The study, containing the conclusions and recommendations of the director, shall be submitted to the Secretary of the Business, Transportation and Housing Agency. Unless otherwise notified by the secretary, the director shall hold public hearings in accordance with the procedures set forth in Article 3 (commencing with Section 35650) of Chapter 5 for the purpose of determining the maximum kingpin to rear axle length, which shall be not less than 38 feet, that the highway or highway segment can sustain without unreasonable threat to the safety of the public. Upon the basis of the findings, the Director of Transportation shall declare in writing the maximum kingpin to rear axle lengths which can be maintained with safety upon the highway. Following the declaration of maximum lengths as provided by this subdivision, the Department of Transportation shall erect suitable signs at each end of the affected portion of the highway and at any other points that the Department of Transportation determines to be necessary to give adequate notice of the length limits.

The Department of Transportation, in consultation with the Department of the California Highway Patrol, shall compile traffic volume, geometric, and other relevant data, to assess the maximum kingpin to rearmost axle distance of vehicle combinations appropriate for those state highways or portion of highways, affected by this section, that cannot safely accommodate trailers or semitrailers of the maximum kingpin to rearmost axle distances permitted under Section 35400. On or before January 1, 1989, the department shall erect suitable signs appropriately restricting truck travel on those highways, or portions of highways, and report its findings and recommendations to the Legislature.

35401.1. A combination of vehicles operated pursuant to Section 35400 or 35401 with a kingpin to rearmost axle measurement of greater than 38 feet but not more than 40 feet may be operated on those highways under the jurisdiction of local authorities only where it is deemed to be safe by the owner of the vehicle or the person operating the vehicle and where its operation is not specifically prohibited by local ordinance pursuant to subdivision (d) of Section 35401.

35401.3. (a) Notwithstanding subdivisions (a) and (b) of Section 35401, a combination of vehicles designed and used to transport motor

As used in this paragraph, "reasonable access" means access substantially similar to that authorized for combinations of vehicles pursuant to subdivision (c) of Section 35401.5 and access authorized through a process substantially similar to that authorized for combinations of vehicles pursuant to subdivision (d) of Section 35401.5.

(c) The Legislature, by increasing the maximum permissible kingpin to rearmost axle distance to 40 feet effective January 1, 1987, as provided in paragraph (4) of subdivision (b), does not intend this action to be considered a precedent for any future increases in truck size and length limitations.

35400.5. Subdivision (a) of Section 35400 does not apply to a motortruck used solely as a cotton module mover and which does not exceed 48 feet in length.

35401. (a) Except as provided in subdivisions (b), (c), and (d), no combination of vehicles coupled together, including any attachments, shall exceed a total length of 65 feet.

(b) (1) A combination of vehicles coupled together, including any attachments, which consists of a truck tractor, a semitrailer, and a semitrailer or trailer, shall not exceed a total length of 75 feet, if the length of neither the semitrailers nor the trailer in the combination of vehicles exceeds 28 feet 6 inches.

(2) A B-train assembly is excluded from the measurement of semitrailer length when used between the first and second semitrailers of a truck tractor-semitrailer-semitrailer combination of vehicles. However, if there is no second semitrailer mounted to the B-train assembly, it shall be included in the length measurement of the semitrailer to which it is attached.

(c) A tow truck in combination with any of the following vehicles authorized to travel on the highway by this chapter is exempt from subdivision (a) when operating under a valid annual transportation permit and within a 100 mile radius of the location specified in the permit:

- (1) A disabled vehicle.
- (2) An abandoned vehicle.
- (3) A disabled or abandoned combination of vehicles.

A tow truck in combination with the above vehicles may exceed the 100-mile radius restriction if a single trip permit is obtained from the Department of Transportation.

(d) Any city or county may, by ordinance, prohibit a combination of vehicles of a total length in excess of 60 feet upon highways under its respective jurisdiction. The ordinance shall not be effective until appropriate signs are erected indicating either the streets affected by the ordinance or the streets not affected, as the local authority determines will best serve to give notice of the ordinance.

(e) Any city or county, upon a determination that a highway or portion of highway under its jurisdiction cannot, in consideration of public safety, sustain the operation of trailers or semitrailers of the maximum kingpin to rearmost axle distances permitted under Section 35400, may, by ordinance, establish lesser distances consistent with the maximum distances that the highway or highway portion can sustain, except that a city or county shall not restrict the kingpin to rearmost axle measurement to less than 38 feet on those highways or highway portions. Any city or county considering the adoption of an ordinance shall consider, but not be limited to, consideration of, all of the following:

equal to two-thirds of the length of the wheelbase of the vehicle carrying such load, except that the wheelbase of a semitrailer shall be considered as the distance between the rearmost axle of the towing vehicle and the rearmost axle of the semitrailer.

35411. (a) Except as provided in subdivision (b), the load upon any combination of vehicles shall not exceed 75 feet measured from the front extremity of the front vehicle or load to the rear extremity of the last vehicle or load.

(b) The load upon any combination of vehicles operating pursuant to Section 35401 or 35401.5, when the overall length of the combination of vehicles exceeds 75 feet, shall be confined within the exterior dimensions of the vehicles.

35414. (a) Except where a load can be transported consistent with the limitations on vehicle and load length specified in other sections of this chapter, the limitations of this chapter as to length of vehicles do not apply when only poles, timbers, pipes, integral structural materials, or single unit component parts, including, but not limited to, missile components, aircraft assemblies, drilling equipment, and tanks not exceeding 80 feet in length are being transported upon any of the following:

(1) Upon a pole or pipe dolly or otherwise lawful trailer used as a pole or pipe dolly in connection with a motor vehicle.

(2) Upon a semitrailer, except for the limitations provided in Section 35410.

(3) Upon a semitrailer and a pole or pipe dolly used in connection with a truck tractor to haul flexible integral structural material.

(b) Poles and the tools and materials incidental to the work to be performed may be transported on a pole or pipe dolly or otherwise lawful semitrailer used as a pole or pipe dolly, transporting not more than three poles not exceeding 80 feet in length and when used by public utility companies or local public agencies engaged in the business of supplying electricity or telephone service, by the Department of Transportation, or by a licensed contractor in the performance of work for a utility, the department, or a local public agency, when such transportation is between a storage yard and job location where such tools and materials are to be used, in which event the limitations of this chapter as to length of vehicles and loads shall not apply.

Invasive Information:

***Ambrosia trifida* L.**

giant ragweed
great ragweed
horseweed

This plant and one or more synonyms are listed as invasive weeds by the authoritative sources noted below. Synonyms are italicized and indented. This plant may be known by one or more common names in different places, and some are listed above. Click on an acronym to view each invasive plant list, or click here for a composite list of **Invasive Plants of the U.S.**

STATE	Assorted authors. 199_. State noxious weed lists for 35 states . State agriculture or natural resource departments.
N'EAST	Uva, R.H., J.C. Neal, & J.M. DiTomaso. 1997. Weeds of the Northeast . Cornell University Press. Ithaca, New York. 397pp.
NE&GP	Stubbendieck, J., G.Y. Friisoe, & M.R. Bolick. 1994. Weeds of Nebraska and the Great Plains . Nebraska Department of Agriculture, Bureau of Plant Industry. Lincoln, Nebraska. 589pp.
SWSS	Southern Weed Science Society. 1998. Weeds of the United States and Canada. CD-ROM . Southern Weed Science Society. Champaign, Illinois.
WSWS	Whitson, T.D. (Ed.) et al. 1996. Weeds of the West . Western Society of Weed Science in cooperation with Cooperative Extension Services, University of Wyoming. Laramie, Wyoming. 630pp.

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Wetlands Indicator Status:

***Ambrosia trifida* L.**

Nat. Ind.	Reg. 1	Reg. 2	Reg. 3	Reg. 4	Reg. 5	Reg. 6	Reg. 7	Reg. 8	Reg. 9	Reg. 0	Reg. A	Reg. C	Reg. H
FAC,FACW	FAC	FAC	FAC+	FAC	FACW	FAC	FACW-	FAC*	FAC	FAC	NO	NO	NO

 Interpreting wetland indicator status

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Other Species Accounts and Images:

***Ambrosia trifida* L.**

View species account from CalFlora.

View species account or photographs from USF Atlas of Florida Vascular Plants.

View species account from ARS Germplasm Resources Information Network (GRIN).

View taxonomic account from Integrated Taxonomic Information System (ITIS) for ITIS Taxonomic Serial Number 36521.


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Related Web Sites:
***Ambrosia trifida* L.**

Rutgers Cooperative Extension: abstract & image
Seedling & leaf images
Delaware Cooperative Extension: control in corn & soybeans
Virginia: abstract & image
FMC Ragweeds Farming Solutions
University of Kentucky: seed identification

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 Intellectual Property Statement / How to Cite the PLANTS Database

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